

Thermodynamics

- Branch of physics concerned with heat and temperature and their relationship to work and energy

Four Laws

Zeroth Law: If 2 systems are in equilibrium with a third system, the first two are also in equilibrium with each other ($a=b$, $b=c$, $a=c$)

First Law: Energy cannot be created or destroyed, only change forms. Net heat supplied to a system equals the work done by the system.

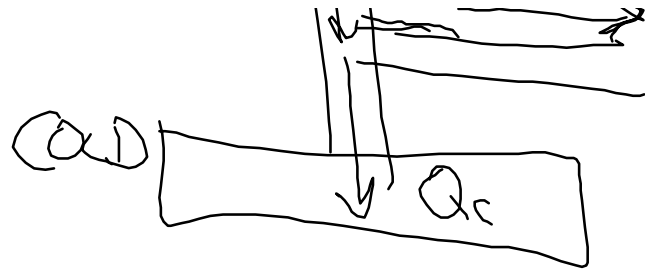
Second Law: Entropy increases over time (max value reached at equilibrium)

Third Law: A temperature approaches absolute zero, entropy approaches a minimum

Heat Engine
 $|Q_h| = |W| + |Q_c|$



$$Q_h = W + Q_c$$



Refrigerator

$$W + Q_c = Q_h$$

